

AMENDMENTS TO THE CLAIMS

1. (currently amended) A thermal barrier coating material comprising composition consisting essentially of a cubic matrix structure of ZrO_2 stabilized by a concentration of Y_2O_3 that is at least 30 wt. % and that is greater than that concentration of Y_2O_3 that would result in a peak ionic conductivity in the matrix.

2. (cancelled).

3. (currently amended) The thermal barrier coating material composition of claim 1, further comprising at least 40 wt. % Y_2O_3 .

4. (currently amended) The thermal barrier coating material composition of claim 1, further comprising at least 50 wt. % Y_2O_3 .

5. (currently amended) A thermal barrier coating material comprising composition consisting essentially of a cubic matrix structure of ZrO_2 stabilized by a concentration of Y_2O_3 that is at least 30 wt. %, wherein the concentration of Y_2O_3 is sufficiently high to create a quantity of multi-vacancy defect clusters in the cubic matrix structure such that the material exhibits a resistance to sintering measured as linear shrinkage to be less than 4000 ppm after exposure to 1400 °C. for 24 hours.

6. (currently amended) A thermal barrier coating material comprising composition consisting essentially of a cubic matrix structure of a rare earth oxide selected from the group of zirconia, hafnia and titania and containing a stabilizer selected from the group of lanthia, ytterbia and yttria, the material comprising a concentration of the stabilizer that is at least 30 wt. % and that is greater than that concentration of the stabilizer that would result in a peak ionic conductivity in the matrix.

7. (cancelled).

8. (currently amended) The thermal barrier coating material composition of claim 6, further comprising at least 40 wt. % stabilizer.

9. (currently amended) The thermal barrier coating material composition of claim 6, further comprising at least 50 wt. % stabilizer.

10. (currently amended) A thermal barrier coating material comprising composition consisting essentially of a cubic matrix structure of HfO₂ stabilized by a concentration of a rare earth oxide Gd₂O₃ that is at least 30 wt. % and that is greater than that concentration of the rare earth oxide that would result in a peak ionic conductivity in the matrix.

11. (cancelled).

12. (cancelled).

13. (currently amended) The thermal barrier coating material composition of claim 11, further comprising at least 40 wt. % Gd₂O₃.

14. (currently amended) The thermal barrier coating material composition of claim 11, further comprising at least 50 wt. % Gd₂O₃.